

L 05269-67 EFT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l) IJP(c)  
ACC NR: AR5023992

SOURCE CODE: UR/0372/66/000/003/G022/G022

AUTHOR: Ignat'yev, M. B.

TITLE: Construction of function generator servos with monitoring and correction

SOURCE: Ref. zh. Kibernetika, Abs. 3G155

REF SOURCE: Sb. Avtomat. i teleanform. sistemy. M. -L., Nauka, 1965, 62-73

TOPIC TAGS: function theory, computer technology, servosystem, digital integrator, tracking system

ABSTRACT: The monitoring and correction method is considered with respect to its applicability to a computing device based on the introduction of redundancy and imposition of constraints for the construction of control computers or function generator servos which may be described by the following differential equations  $y_i' = f_i(y_1, \dots, y_n, \xi_1, \dots, \xi_k)$ ,  $i = 1, 2, \dots, n$ , where  $\xi_1, \dots, \xi_k$  are time functions inserted from the outside into the device. This is exemplified by the examination of an integrator with monitoring and correction, a function generator and a multiplying device. 3 illustrations. Bibliography of 5 titles. V. M. [Translation of abstract]

SUB CODE: 09, 12/

Card 1/1 eqh

UDC: 681.142.1.01

L 04995-67 EWT(d)/EMP(v)/EWP(k)/EWP(h)/EWP(l) GD

ACC NR: AT6018442

(A)

SOURCE CODE: UR/0000/65/000/000/0351/0360

AUTHOR: Voronov, A. A.; Ignat'yev, M. B.

ORG: none

TITLE: On searching for function extrema in automatic systems

SOURCE: International Federation of Automatic Control, International Congress, 2d, Basel, 1963. Diskretnyye i samonastroyayushchiyesya sistemy (Discrete and adaptive systems); trudy kongressa. Moscow, Izd-vo Nauka, 1965, 351-360

TOPIC TAGS: function analysis, digital differential analyzer, computer programming

ABSTRACT: The report examines one of the possible approaches to the problem of synthesizing local systems for automatic search for extrema of functions with many variables. The principle itself of constructing systems reacting to particular derivatives of the desired function with respect to coordinates of the reacting elements is not new, but the method discussed, which was first used in the Electrical Engineering Institute, Leningrad (Institut elektromekhaniki) rose in connection with designing a system of programmed control of metalworking machines, first to reproduce plane curves and then curves lying in a given surface, and made it

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AT6016442

possible not only to indicate the general methods of synthesis of digital differential analyzers for reproducing different types of multidimensional curves, but also to show a very general method of designing a search system for multivariable function extrema. The method also finds extrema at the intersection of multidimensional surfaces. The report treats the structure of differential equations whose solution lies on the intersection of multidimensional surfaces, the finding of function extrema, and searching for function extrema in automatic systems. Possibilities of combined search are briefly treated. Orig. art. has: 11 formulas and 2 figures.

SUB CODE: 09,12/ SUBM DATE: 29Sep65/ ORIG REF: 013/ OTH REF: 001

Cord 2/2 *llh*

ACC NR: AP6024368

SOURCE CODE: UR/0280/66/000/002/0094/0106

AUTHOR: Ignat'yev, M. B. *(Leningrad)*

ORG: none

TITLE: Control and correction during the solution of differential equations by means of computers

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 2, 1966, 94-106

TOPIC TAGS: ordinary differential equation, differential equation, computer reliability, test monitoring

ABSTRACT: By contrast with automatic regulation systems, computational devices and processes lack feedback and so are more susceptible to malfunction and failure. To offset this disadvantage, in cases of computerized solution of ordinary differential equations, the author proposes introducing redundancy in the form of a control problem with control variables; the correctness of the solution of this problem is a criterion of the correctness of the entire computational problem. Thus, for the starting equations

$$\frac{dx}{dt} = f_1(x, y, t), \quad \frac{dy}{dt} = f_2(x, y, t) \quad (1)$$

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ACC NR: AP6024368

redundancy may be introduced by putting

$$x = a_1x_1 + a_2x_2 + a_3x_3, \quad y = b_1x_1 + b_2x_2 + b_3x_3 \quad (2)$$

where  $a_1, b_1$  are constant coefficients. Now a control condition may be imposed on this expanded system, such that the verification of the satisfaction of this condition should provide sufficient information on the course of the entire computational process. Such a control condition may be the linear equation with constant coefficients

$$m_1x_1 + m_2x_2 + m_3x_3 = 0. \quad (3)$$

Noiseproof algorithms based on the adjustment of  $a_1, b_1$  and other coefficients to the mathematical expectation and variance of noise may be constructed. Feedback (automatic correction of solution) is accomplished by introducing new variables. This method makes it possible to extend feedback to the computational process in analog, digital and hybrid computers and to markedly enhance the reliability and accuracy of the solution. Orig. art. has: 4 figures, 51 formulas.

SUB CODE: 12, 09/ SUBM DATE: 04May64/ ORIG REF: 008/ OTH REF: 001

Cord. 2/2

25(1)

SOV/148-59-2-16/24

**AUTHORS:** Timofeyev, A.A., Candidate of Technical Sciences, and Ignat'yev, M.G., Engineer

**TITLE:** The Problem of Ethylsilicate Hydrolysis in Smelted-Form Casting (K voprosu o gidrolize etilsilikata v lit'ye po vyplavlyayemykh modelyami)

**PERIODICAL:** Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, 1959, Nr 2, pp 117-125 (USSR)

**ABSTRACT:** Kurohman, Rubtsov, Shklennik, Liferenko and Aksenov [Ref 1-5] have different opinions on the necessary quantity of water in ethylsilicate hydrolysis used for binder production in smelted-form casting. The quality of the ceramic shell obtained by hydrolysis with different water consumption was investigated with the use of commercial ethylsilicate ( $\text{SiO}_2$  - 31.3%;  $\text{HCl}$  - 0.2%). Five variants of hydrolysis were carried out and the quality of the ceramic shell was determined by various factors such as: mechanical properties, rate of hydrolysis and syneresis, and crack formation after calcination. It was stated that optimum strength of the shell was obtained by the combined effect of hydrolysis, syneresis and the elimination of water bound by the gel. The strength of the shell increased with a higher water

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The Problem of Ethylsilicate Hydrolysis in Smelted-Form Casting

consumption. Bending strength and deflection are characteristic of the plastic properties of the shell which depend on the water consumption in the gel. Crack formation is inversely proportional to the shell strength. The tests proved that maximum strength and plasticity and minimum cracking of the shell were obtained by ethylsilicate hydrolysis, producing gel of dimetasilicic acid ( $H_2Si_2O_5$  or  $SiO_2 \cdot 0.5 H_2O$ ). The author presents graphs where the rate of hydrolysis and syneresis and mechanical properties are plotted versus different variants of hydrolyses. There are 9 graphs and 7 references, 6 of which are Soviet and 1 English

ASSOCIATION: Sibirskiy metallurgicheskiy institut (Siberian Metallurgical Institute), Kafedra liteynogo proizvodstva (Chair of Casting Industry)

SUBMITTED: August 7, 1958

Card 2/2

ANDRYUSHCHENKO, Yu.S.; BAGIN, Yu.I.; BASHKIRTSEV, A.A.; BELIN'KOV, G.Ye.;  
 BELINICHEN, I.Sh.; BUSHUYEV, N.M.; VAGANOV, A.K.; GASHEV, A.M.;  
 YES'KOV, K.A.; ZGIRSKIY, Ch.I.; IGANT'YEV, M.I.; KORUSHKIN, Ye.N.;  
 KUZ'MOV, N.T.; PATSKOVICH, I.R.; PICHAK, P.I.; PAYTENS, V.B.;  
 RUDAKOV, A.S.; SAFRYKIN, V.M.; SIDOROV, P.P.; UMINSKIY, Ye.A.;  
 KHANZHIN, P.K.; CHEREMOVSKIY, Yu.I.; YERAKHTIN, D.D., kand. tekhn.  
 nauk, retsenzent; MAKAROV, M.P., inzh., retsenzent; TORBYEV, Z.S.,  
 kand. tekhn. nauk, retsenzent; POLKANOV, I.P., kand. tekhn. nauk,  
 retsenzent; IGNAT'YEV, M.G., agronom, retsenzent; GUTMAN, I.M.,  
 inzh., retsenzent; FIMAKOV, N.P., tekhn. red.; SARAFANNIKOVA, G.A.,  
 tekhn. red.

[Reference manual for the agricultural machine operator] Spravochnik  
 mekhanizatora sel'skogo khoziaistva. Pt.2. [Repair of tractors and  
 agricultural machinery] Remont traktorov i sel'skokhoziaistvennykh  
 mashin. Pod red. N.M. Bushueva. Moskva, Gos. nauchno-tekhn. izd-  
 vo mashinostroit. lit-ry. 1957. 335 p. (MIRA 11:9)

(Agricultural machinery—Maintenance and repair)



VASIL'YEV, Nikolay Alekseyevich; ABRAMOV, Georgiy Aleksandrovich;  
SHERGYNV, M.P., prof., red.; ALEKSHYEV, G.P., inzh., red.;  
BUSHUYEV, N.M., kand.tekhn.nauk, red.; GUTMAN, I.M., inzh., red.;  
KUZ'MOV, N.T., inzh., red.; IGNAT'YEV, M.G., agronom, red.;  
PICHAK, F.I., kand.tekhn.nauk, red.; POLKANOV, I.P., kand.tekhn.  
nauk, red.; DUGINA, N.A., tekhn.red.

[Repair of machinery according to a yearly chart] Remont mashin  
po kruglogodovomu grafiku. Pod red. M.P.Sergeeva. Moskva, Gos.  
nauchno-tekhn.isd-vo mashinostroit.lit-ry, 1959. 66 p.

(MIRA 14:2)

(Agricultural machinery--Maintenance and repair)

BELOUSOV, Semen Nikolayevich; ALEKSHYEV, G.P., inzh., red.; GUTMAN, I.M., inzh., red.; KUZ'MOV, M.T., inzh., red.; FEDOROV, N.G., kand.tekhn. nauk, red.; IGnat'YEV, M.G., agronom, red.; PICHAK, F.I., kand. tekhn.nauk, red.; POLEKINOV, I.P., kand.tekhn.nauk, red.; MARCHENKOV, I.A., tekhn.red.

[Machines for the reclamation of new lands] Mashiny dlia razrabotki novykh zemel'. Moskva, Gos.nauchno-tekhn.isd-vo mashinostroit. lit-ry. 1960. 69 p. (MIRA 13:7)  
(Reclamation of land)

PIATETSKIY, Boris Grigor'yevich; ALEKSEYEV, G.P., inzh., red.; BUSHUYEV, N.M., kand.tekhn.nauk, red.; GUTMAN, I.M., inzh., red.; KUZ'MOV, N.T., inzh., red.; IGNAT'YEV, M.G., agronom, red.; PICHAK, P.I., kand.tekhn.nauk, red.; POLKANOV, I.P., kand.tekhn.nauk, red.; DUGINA, N.A., tekhn.red.

[Recent developments in the repair of agricultural machinery]  
Novoe v remonte sel'skokhoziaistvennoi tekhniki. Moskva, Gos. nauchno-tekhn.isd-vo mashinostroit.lit-ry, 1960. 99 p.

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(Agricultural machinery--Maintenance and repair)

DUNAYEV, Petr Aleksandrovich; RAYTSER, Veniamin Borisovich; ALEKSEYEV, G.P.,  
red.; BUSHUYEV, N.M., kand.tekhn.nauk, red.; GUTMAN, I.M., inzh.,  
red.; KUZ'MOV, N.T., inzh., red.; IGHAT'YEV, M.G., agronom, red.;  
PICHAK, F.I., kand.tekhn.nauk, red.; POLKANOV, I.P., kand.tekhn.  
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[Forging in the repair of agricultural machinery] Kusnechnoe delo  
v remonte sel'skokhoziaistvennoi tekhniki. Izd.2. Moskva, Gos.  
nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1960. 158 p.

(MIRA 14:1)

(Forging) (Agricultural machinery--Maintenance and repair)

KUZ'MOV, Nikolay Terent'yevich; IGNAT'YEV, Mikhail Gerasimovich;  
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retsentsent; BUSHUYEV, N.M., kand.tekhn.nauk, red.; DUCINA,  
N.A., tekhn.red.

[Mechanization of livestock farms; manual for collective-farm  
workers] Mekhanizatsia zhivotnovodcheskikh ferm; spravochnik  
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*I (NAT'VEY M.I.)*  
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 retsensent; MAKAROV, M.P., inzh., retsensent; TOREBYEV, Z.S., kand.  
 tekhn.nauk, retsensent; POLKANOV, I.P., kand.tekhn.nauk, retsensent;  
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[Manual for agricultural mechanizers] Spravochnik mekhanizatora  
 sel'skogo khoziaistva. Moskva, Gos.nauchno-tekhn.isd-vo mashinostroit.  
 lit-ry. Pt.1. [Tractors and automobiles, agricultural machinery and  
 implements, and operation of machine and tractor yards] Traktory i  
 avtomobili, sel'skokhoziaistvennye mashiny i orudiia, ekspluatatsiia  
 mashinno-traktornogo parka. Pod. red.M.M.Bushueva. 1957. 462 p.  
 (MIRA 10:12)

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 retsenzent; IGANT'YEV, M.G., agronom, retsenzent; GUTMAN, I.M.,  
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 RUDAKOV, A.S., SAPHYKIN, V.M., SIDOROV, F.P., UMINSKIY, Ye.A.  
 KHANZHIN, P.K., CHEREMOVSKIY, Yu.I., BUSHUYEV, N.M., kand.tekhn.  
 nauk, red.; DUGINA, N.A., tekhn.red.

[Manual for agricultural machinery operators] Pt. 3. Stationary  
 internal combustion engines, steam engines and windmills. Rural  
 electrification. Mechanization of production in animal husbandry.  
 Spravochnik mekhanizatora sel'skogo khoziaistva. Pt. 3. Statsionarnye  
 dvigateli vnutrennego sgoraniia, lokomobili i vetrodvigateli.  
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 protsessov v zhivotnovodstve. Pod red. N.M. Bushueva. Moskva,  
 Gos.nauchno-tekhn. izd-vo mashinostroit. lit-ry. 1957. 200 p.  
 (MIRA 11:9)

(Agricultural machinery)



IONAT'YEV, N.K.

Spectral study of beats between two-dimensional scanning systems.  
Kristallografiia 5 no.3:383-389 My-Je '60. (MIRA 13:8)  
(Optics, Physical)

IGNAT'YEV, N.K.

General methods of investigating discrete systems. **Elektrosvias'**  
14 no.8:3-11 Ag '60. (MIRA 13:9)  
(Information theory)

IGNAT'YEV, N.K.; PIROGOV, A.A.

Theory of the integral reception of telegraph signals. Elektros-  
viaz' 14 no.9:72-73 S '60. (MIRA 13:9)  
(Telegraphy, Wireless)

IGNAT'YEV, M. V.

IGNATIEV, M. V.

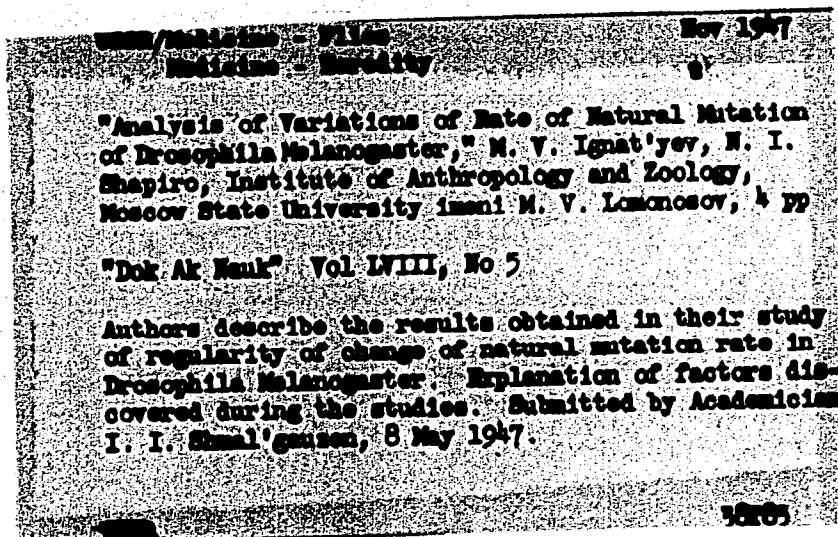
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SO: Advances in Modern Biology (Uspekhi Sovremennoi Biologii) Vol. XX, Vol.3, 1945.

*Instit. Zool. & Anthropology, Moscow State U*

IGNAT'YEV, M. V.

PA 38103



IGNAT'YEV, M. V.

"The Theory and Means of Constructing Anthropological Standards  
for the Mass Production of Articles for Human Consumption." Sub 11  
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Dissertations presented for science and engineering degrees in  
Moscow during 1951.

SO: Sum. No. 480, 9 May 55

IGNAT'YEV, M.V., doktor biologicheskikh nauk, otvetstvennyy redaktor;  
POMALEN'KAYA, O.T., redaktor; MULIN, Ye.V., tekhnicheskiiy redaktor

[Papers delivered at a conference on human morphology] Materialy  
konferentsii po morfologii cheloveka. [Moskva] Izd-vo Moskovskogo  
univ., 1956. 153 p. (MLRA 9:12)

1. Konferentsiya po morfologii cheloveka, Moscow, 1952.  
(MORPHOLOGY)

IGNAT'YEV, M. V., Professor

"Condition of Normality of Distribution of Anthropological Features,"  
Lomonsov Lectures in 1956, Vest. Mosk. U., Physico Math and Natural Sciences  
Series, 4, No. 6, pp 147-160, 1956. Biological Soil Faculty

Translation U-3054, 363



IGNAT'YEV, M.V.

"Concerning the Influence of Vitamin C on Prothrombin of Blood in Patients With Atherosclerosis," by M. V. Ignat'yev, Lt Col of Medical Service, Voyenno-Meditsinskiy Zhurnal, No 6, Jun 56, p 70 ✓

Various studies were conducted on 28 patients suffering from general atherosclerosis and coronary sclerosis. After prescribing for them a diet supplemented with 100 mg of vitamin C t. i. d., it was found that more than half of patients exhibited decreased prothrombin index, which indicates a normalization of blood coagulation process by vitamin C administration.

SUM. I287

~~IGNAT'YEV, M.V.~~  
IGNAT'YEV, M.V.

Tolerance of patients with atherosclerotic atherosclerosis combined with disorders of the conductive function of radon baths. Klin.med. 35[1.e.34] no.1 Supplement:7-8 Ja '57. (MIRA 11:2)

1. Iz sanatoriya "Arkhangel'skoye."  
(HEART--DISEASES) (RADON--THERAPEUTIC USE)

IGNAT'YEV, M.V.

Effect of various doses of vitamin C on prothrombin in the blood  
in arteriosclerosis. Terap. arkh. 29 no.7:52-53 J1 '57.

(ARTERIOSCLEROSIS, therapy, (MIRA 11:4)

vitamin C, eff. on prothrombin (Rus)

(VITAMIN C, therapeutic use,

arteriosclerosis, eff. on prothrombin (Rus)

(PROTHROMBIN,

eff. of vitamin C in arteriosclerosis (Rus)

17(12)

SOV/177-58-11-30/50

AUTHOR: Ignat'yev, M.V., Lieutenant-Colonel of the Medical Corps

TITLE: The Problem of the Effect of Large Doses of Vitamin C on Blood Pressure in Patients Suffering From Hypertonia

PERIODICAL: Voenno-meditsinskiy zhurnal, 1958, Nr 11, p 83 (USSR)

ABSTRACT: The article is based on the observation of the effect of large doses of vitamin C on the vascular tonus in 37 patients suffering from hypertonia. Each of the patients received 0.9 vitamin C daily over the course of 28 days. The blood pressure was measured every 4th day with the aid of a mercury apparatus and Korotkov's auscultatory method. To detect the effect of large doses of vitamin C on the blood pressure, the author compared the figures of the arterial pressure at admission to the hospital and at dis-

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SOV/177-58-11-30/50  
The Problem of the Effect of Large Doses of Vitamin C on Blood Pressure in Patients Suffering From Hypertonia

charge. The analysis of these data showed no increase of the blood pressure in all 37 persons. Furthermore, the administration of large doses of vitamin C over the course of 28 days had no hypertensive effect on patients suffering from hypertonia.

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IGNAT'YEV, M.V.

Effect of food intake on the electrocardiograms of patients  
with coronary insufficiency. Klin.med. 37 no.7:78-82 J1  
'59. (MIRA 12:10)

(ELECTROCARDIOGRAPHY)  
(CORONARY DISEASE diag.)  
(FOOD)

IGNAT'YEV, M.V.

Problem of dynamic changes in the electrocardiogram in patients  
with arteriosclerosis. Klin. med. 38 no. 2:66-68 F '60.

(MIRA 14:1)

(ARTERIOSCLEROSIS) (ELECTROCARDIOGRAPHY)

IGNAT'YEV, M. V. Lieutenant Colonel of the Medical Service-Light (Ultraviolet)  
Deficiency.

Voyenno-Meditsinskiy Zhurnal, No. 11, 1961, pp. 70-79.



IGNAT'YEV, M.V.

Use of reserpine in hypertension with arteriosclerosis of the  
coronary arteries. Kardiologiya 1 no.2:77-78 Mr-Apr '61,

(MIRA 15:1)

(RESERPINE) (HYPERTENSION) (CORONARY HEART DISEASE)

IGNAT'YEV, M.V., podpolkovnik meditsinskoy sluzhby

Deficiency of exposure to light. Voen.-med. zhur. no.11:72-73  
N '61. (MIRA 15:6)

(PHOSPHATASE)  
(DEFICIENCY DISEASES--DIAGNOSIS)

IGNAT'YEV, M.V.; Prinimal uchastiye: KHATSUR, A.D., metodist lechebony  
gimnastiki

Oxyhemometric studies of atherosclerosis. Sov. med. 25 no.7: 35-38  
Jl '61. (MIRA 15:1)

1. Iz klinicheskogo sanatoriya "Arkhangel'skoye" Moskovskoy oblasti  
(nachal'nik - kand.med.nauk M.M.Gilenko).  
(ARTERIOSCLEROSIS) (BLOOD\_OXYGEN CONTENT)

IGNAT'YEV, M.V.

Effect of ascorbic acid on the blood plasma tolerance to  
heparin in patients with vascular atherosclerosis. Kardi-  
logiia 3 no.3: My-Je'63. (MIRA 16:9)

1. Iz Tsentral'nogo voyennogo krasnoznamennogo gosпиталя  
imeni P.V.Mandryka (nachal'nik - general-mayor meditsin-  
skoy sluzhby N.M.Nevskiy)  
(ASCORBIC ACID) (HEPARIN)  
(ARTERIOSCLEROSIS)

IGNAT'YEV, N.A.

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Trade Unions. Vol. 1 san. tekhn. no.2:39 F '61.

(MIRA 14:7)

(Industrial safety)

BIRYUKOV, A.A., inzh.; IGNAT'YEV, N.A., inzh.

Results achieved by the sanitary engineering industry in four  
years of the seven-year plan. Vod.i san.tekh. no.2:1-3 F '63.  
(MIRA 16:2)

(Sanitary engineering)

1.1710  
1.2300

26020

S/135/61/000/008/010/011  
A006/A101

AUTHORS: Silayev, A.F., Candidate of Technical Sciences, Ignat'yev, N.A.,  
Engineer

TITLE: On the expediency of heat treatment of welded heavy press frames

PERIODICAL: Svarochnoye proizvodstvo, no. 8, 1961, 40 - 43

TEXT: There are different opinions on the expediency of heat treatment of welded structures for removing residual stresses. The permissible magnitude of residual stresses in welded units and machines has as yet not been established. Therefore the gathering of experimental data obtained from specimens and natural welded structures is of considerable importance. For this purpose an investigation was made by the authors and Yu.N. Zaytsev, G.I. Shevlyakov, V.A. Ignat'yev, and P.V. Novichkov. Tests were performed with 120 kg specimens welded from 60 mm thick steel. Reactive stress fields were obtained by welding-on corner plates. Residual stresses in the built-up metal, the heat-affected zone and the base metal were determined by the diffraction-roentgenographical method. Vibration of specimens as a means of reducing residual stresses was for the first time checked in the Soviet Union, yielding satisfactory results. Moreover, residual

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A006/A101

On the expediency ...

stresses were directly determined on welded press frames, manufactured at the Voronezh Plant of Heavy Mechanical Presses without heat treatment of the welded structures. K274A and K862 frames were subjected to welding, heat treatment, and vibration; stresses from useful loads were determined. The weld joints were subjected to ultrasonic control with the aid of flaw detector УЗД-7Н (UZD-7N). The distribution of residual stresses was studied by the tensometrical method with or without partial trepanation of the frames. Standard pickups of 25 mm base, 120 ohm resistance and a coefficient of sensitivity  $K = 2.1$  were glued on both the internal and external sides of the frames in order to estimate approximately the bending stresses determining the deformation of the frame. The deformation of the pickups was measured with an automatic electronic ЭИД-3 (EID-3) device. The experiments performed showed that heat or other treatment of welded frames was not expedient. This conclusion is confirmed by the results of analyzing the operation of welded frames which were not heat treated, namely: 1) cracks and other defects caused by residual stresses were not observed in welded press frames and shears, operating over 4 - 5 years; 2) the accuracy of the presses is satisfactory; losses in motor power during idle run are low; 3) the fatigue strength of frames in complex-strained state in the presence of stress concentra-

Card 2/3



On the expediency ...

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X

tors such as poor fusion, is satisfactory. On the basis of results obtained the authors recommend the organization of a model experimental shop for welded structures at the Voronezh plant without a heat treatment department. There are 6 figures, 1 table and 5 Soviet-bloc references.

Card 3/3

**"APPROVED FOR RELEASE: 04/03/2001**

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**APPROVED FOR RELEASE: 04/03/2001**

**CIA-RDP86-00513R000518410010-1"**

24(4)

AUTHOR:

Ignat'yev, N. A.

SOV/32-25-3-49/62

TITLE:

Differential Counters for X-Rays and Their Use (Differentsial'-nyye schetchiki rentgenovskikh luchey i ikh primeneniye)

PERIODICAL:

Zavodskaya Laboratoriya, 1959, Vol 25, Nr 3, pp 369-372 (USSR)

ABSTRACT:

This paper was read at the Nauchno-tekhnicheskoye soveshchaniye po primeneniyu rentgenovskikh luchey k issledovaniyu materialov (Scientific-technical Conference on the Application of X-Rays in Material Checking) held in Leningrad in 1958. Differential counters were designed which can be used for precision measurements of the changes in crystal lattices for X-ray structural and X-ray spectrum analyses. The differential counter with fixed emitter may be manufactured of two Geiger counters, or of two proportional counting tubes separated by a wedge (Fig 1). The wedge serves not only as a partition between the counting tubes, but also as the photo-electron emitter of absorbed X-rays. An experimental investigation of the setup of the differential counter as to aluminum emission lines resulted in a mean square error of approximately  $0.001^\circ$  in angles  $\theta$ . The investigations were carried out by means of a goniometer of the URS-50-I

Card 1/2

Differential Counters for X-Rays and Their Use SOV/32-25-3-49/62

unit. An automatic setup was developed for the differential counter by which it is made possible to follow shifts of the diffraction line which may occur due to certain factors (as, e.g. temperature) (Fig 2). The diagram of an automatic recording of the parameter changes of the crystal lattice (line shift) of angle  $\theta$  is given for the line  $K_{\alpha 1}$  Cu(333) of aluminum as a function of a steady temperature change (Fig 3). Besides the above apparatus a circular differential counter (Fig 4) as well as a differential counter with a movable diaphragm (Fig 5) were suggested. An application of the pattern described renders possible the manufacture of an apparatus for the continuous analysis of solutions and for an automatic control of production processes. A diagram obtained during a quantitative X-ray spectrum analysis of copper in a copper sulphate solution is given (Fig 6). There are 6 figures and 2 references, 1 of which is Soviet.

ASSOCIATION: Voronezhskiy gosudarstvennyy universitet  
(Voronezh State University)

Card 2/2

IGNAT'YEV, N. A.

Cand Phys-Math Sci - (diss) "Differential methods of X-ray structure and X-ray spectral analysis." Voronezh, 1961. 13 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Rostov State Univ); 150 copies; price not given; (KL, 6-61 sup, 193)

L 15208-66 EWT(m)/T/EWP(t)/EWP(b) LWP(c) JD

ACC NR: AP6001298

SOURCE CODE: UR/0363/65/001/008/1323/1325

AUTHOR: Ugay, Ya. A.; Ignat'yev, N. A.; Marshakova, T. A.; Aleynikova, K. B.

ORG: Voronezh State University (Voronezhskiy gosudarstvennyy universitet)

TITLE: Preparation of a single crystal of the intermetallic compound Cd<sub>4</sub>Sb<sub>3</sub> and its properties

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 8, 1965, 1323-1325

TOPIC TAGS: cadmium compound, antimony compound, zone melting, single crystal growing

ABSTRACT: In order to select a method for preparing Cd<sub>3</sub>Sb<sub>3</sub> single crystals, thermographic and x-ray diffraction studies were carried out to determine the temperature and concentration limits of existence of this compound. Four thermal effects were observed on the heating curves of alloys containing from 25 to 51 wt. % Sb: the first (a small endothermic effect) could not be identified; the second (exothermic) corresponds to the conversion Cd<sub>4</sub>Sb<sub>3</sub> → 3CdSb + Cd; the third (298C) was due to the fusion of the cadmium eutectic; the fourth (438C) was the fusion of CdSb. Zone melting was found to be the most suitable method for preparing Cd<sub>4</sub>Sb<sub>3</sub> single crystals. Despite the imperfect structure of the crystals obtained, their electric parameters were more interesting than those of polycrystalline samples, because Cd<sub>4</sub>Sb<sub>3</sub> single crystals contain an excess of antimony, which causes a higher carrier concentration. The structure of the compound Cd<sub>4</sub>Sb<sub>3</sub> was refined: it was found to belong to the trigonal

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ACC NR: AP6001298

system, Laue class  $D_{3d} - \bar{3}m$ . In the hexagonal derivation, the lattice parameters  $a = 13.04 \text{ \AA}$ ,  $c = 22.45 \text{ \AA}$ . Orig. art. has: 2 figures and 1 table.

SUB CODE: 11,20 / SUBM DATE: 18May65 / ORIG REF: 004 / OTH REF: 003

TS  
Card 2/2

IGNAT'YEV, N. A.

*cu*

Amphibolites, garnet-gedrites and micrites from Shvartshil, Karelia. N. A. Ignat'yev. *Trav. Inst. petrog. acad. sci. U. R. S. S. G. R.* 42 (1934); *Mineralog. Abstracts* 6, 419.—Intrusions of granite and pegmatite into the amphibolites of Karelia has caused intense metamorphism with production of garnet-gedrites and garnet-micrites, which, however, differ little in chem. composition from the original amphibolite. Garnet is mainly alumin silite-pyrops, and crystals up to 25 cm. across occur in the pegmatite. Gedrite occurs as dark green crystals with d. 3.223; A complete analyses. C. A. Billerand



IGNAT'YEV, I. A.

Volkonskoite of the Kama River region. V. V. Alek-sandrov, N. A. Ignat'yev, and G. G. Kobayak (The Molotov State Univ., Kazan). *Uchenye Zapiski Molotovskogo Gosudarst. Univ. im. M. Gorkogo* 4, No. 3, 5-74 (English summary, 74-6) (1940).--Under the microscope, volkonskoite shows in transmitted light various nonpleochroic colors from light emerald-green to dark-brown, corresponding to the macroscopic colors. In its green and dark-green varieties a reticulate spongy or foamlike structure is often observed (250-300-fold magnification). In crossed nicols volkonskoite shows different degrees of birefringence. The character of structures in crossed nicols depends on the disposition of birefringent thin-scaled, radial, fibrous, spindle-shaped, worm-shaped, or minutest acicular aggregates. Alongside of the birefringent substance there are always isotropic portions. Colored birefringent formations are close to kaolin in their optical const. The colorless portions are represented by amorphous silica at various stages of crystn. Structurally, volkonskoite is a hydrosol. The chem. compn. is:  $\text{SiO}_2$  35.00-40.70,  $\text{Al}_2\text{O}_3$  1.48-4.20,  $\text{Cr}_2\text{O}_3$  14.62-26.40,  $\text{Fe}_2\text{O}_3$  1.00-0.18,  $\text{FeO}$  0.04-3.40,  $\text{CaO}$  2.00-6.36,  $\text{MgO}$  1.00-7.06,  $\text{MnO}$  0-0.30,  $\text{H}_2\text{O}$  (up to 105°) 11.55-18.18,  $\text{H}_2\text{O}$  (above 105°) 4.12-0.07, and total loss on ignition 18.00-25.54%. On that basis, its av. empirical formula is  $1.27\text{RO} \cdot \text{R}_2\text{O}_3 \cdot 3.03\text{SiO}_2 \cdot 1.94\text{H}_2\text{O} + 4.77\text{H}_2\text{O}$ , close to that of montmorillonite. Thermal analyses indicate in all the varieties 4 endothermal and 1 exothermal transition due to hydroxides of Cr, Al, and Si, and to kaolin. Thus, the mineral is a heterogeneous system, composed of the mixt. of Cr-Al-Si hydrates (the kaolin constituent) with hydrogels of Cr, Al, Si, and Fe, and with the presence of absorbed alk. earth elements. The presence of various colors in volkonskoite depends on the presence of the chromiferous elements  $\text{Cr}^{+++}$  and  $\text{Fe}^{+++}$  and it should be referred to the group of kilochromatic minerals.

W. R. Henn

IG NAT'YEV, N.A. 24										PROCESSES AND PROPERTIES INDEX 8									
<p>Composition and properties of "vaps." N. A. Ignatiev and A. M. Kuznetsov (Molotov State Univ., Russia). <i>Compt. rend. acad. sci. U.R.S.S.</i> 53, 853-4 (1948) (in English).—The "vaps" are argillite-like, stony, pelitoides; in color, they are brown, dark-brown, gray, and dark-green. They are the predominant rocks of the lower part of the Kazan stage. They enclose lenses of cross-bedded, fine-grained sandstones and bands of limestones. The "vaps" consist of elastic grains 10<sup>-2</sup> to 10<sup>-4</sup> cm. in diam. As a result of chem. analysis, thermal studies, etc., the mineralogical compn. is inferred to be quartz 11, plagioclase 14, potash feldspar 10, montmorillonite 30, chlorite 12, pyrite 0.1, ferric oxide 2, gypsum 0.3, dolomite 2.0, calcite 3%. Two chem. analyses are given. (G. T. F.)</p>																			
ASH-SLA DETAILING LITERATURE CLASSIFICATION																			
SOURCE NO. SOURCE AND COUNTRY ORIGIN																			
CREATION NO.																			

CAIGNAT'YEV, N.A.

**Lens-shaped formations of gypsum.** A. M. Kuznetsov and N. A. Ignat'ev (A. M. Gorkii State Univ., Moscow). In *Doklady Akad. Nauk S.S.S.R.* 63, 431-4 (1948).-- In Permian sediments, especially in dolomites of the Kungura horizons near the mouth of the Chusova River, gypsum is abundant as lens-shaped concretions of 0.12 to 5.8 g. wt. The principal diam. of these lenses vary as a nearly linear func-

tion of the thickness. Dark-colored lenses are covered by a smooth film of parallel-fibrous structure which contains pyrite in crystals of 10 to 80  $\mu$  diam. The gypsum is mostly fine cryst., monoclinal; in the central parts sometimes anhydrite grains (10 to 20  $\mu$  diam.) are observed, and isometric dolomite (1  $\mu$ ). Sometimes, spherulitic quartzine (black, pos.) of 30 to 40  $\mu$  diam. is observed between the gypsum. Rhythmic lensing diffusion bands of colored Fe hydroxides are typical for these spherulites, following in distances of 2 to 4  $\mu$ . Chem. analyses are given for the gypsum and dolomite concretions, the latter with a quartzine content of 12 to 19%. The lenses probably originated from a reaction of diffusing  $MgSO_4$  solns. with pptd.  $CaCO_3$ , as concluded from thin gypsum veinlets between the lenses. In the same direction the  $Fe^{2+}$  and silica were diffusing. Similar reactions are observed in salt lake sediments of the Crimean peninsula; with much higher NaCl concns. the crystn. of anhydrite is characteristic, e.g. in the salt rocks of Solikamsk. W. Eitel.

CA. IGNAT'YEV, N. A.

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1954

Chemical character of "Vapv" rocks. A. M. Kuznetsov, and N. A. Ignat'ev (A. M. Gor'kiy State Univ., Moscow). *Doklady Akad. Nauk S.S.S.R.* 70, 237 (1951). "Vapv" are multicolored hardened pelite rocks, widespread in the Prikazanian formation of the Kazan depression. 103 chem. analyses are evaluated for a systematic classification of them compared in the  $RO, CaO, SiO_2$  concn. triangle, and for a comparison with the Middle-Asiatic and Cambrian (Leningrad region) clay sediments. The rule is established that with increasing  $RO(CaO + MgO)$  content the ignition loss and  $CaCO_3$  (sol. in 5% HCl) increases and the  $SiO_2 + K_2O$  decreases.  $CaCO_3$  is the principal carbonate in the "vapv" which are intermediate between clays and marls. They are best characterized as massive carbonate argillites. Among the silicates, montmorillonite and chlorite are the prevailing clay minerals and have a high MgO content (insol. in 5% HCl).

W. Ford

ENTSOV, G. I.; IGNAT'YEV, N. A.; STARKOV, N. P.

Volkonskoite - Kama Valley

Study of the geologic-petrographic characteristic of volkonskoite deposits of the Kama region. Zap. Vses. min. ob. 81 No. 3, 1952

Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

KUZNETSOVA, L.S.; IGNAT'YEV, N.A.

Mottled dolomites of the Chusovoy region in the western  
slope of the Urals. Dokl. AN SSSR 157 no.4: 82-885 Ag '64  
(MIRA 17:8)

1. Permskiy gosudarstvennyy universitet im. A.M. Gor'kogo.  
Predstavleno akademikom N.M. Strakhovym

IGNAT'YEV, N.G., aspirant

Correction of the measuring force of feeler profilometers by  
means of electromechanical feedback. Izv. vys. ucheb.zav.; prib.  
no.2:83-92 '58. (MIRA 11:7)

1. Leningradskiy institut tochnoy mekhaniki i optiki.  
(Surfaces (Technology)--Measurements) (Electronic measurements)

IGNAT'YEV, N. G..

Textile Machinery

Substituting stainless steel for bronze in making grooved cylinders. Tekst. prom. 12  
no. 3, 1952

1v List of Russian Accessions, Library of Congress, April 1952. Unclassified.



MATVEYEV, L.T.; SMIRNOV, P.I.; ASTAPENKO, P.D.; IGNAT'YEV, N.I.,  
red.; SRIBNIS, N.V., tekhn. red.

[Principles of aviation meteorology] Osnovy aviatsionnoi  
meteorologii; odobreno Glavnym Shtabom Voenno-Vozdushnykh  
Sil v kachestve uchebnogo posobiia dlia kursantov aviatsion-  
nykh uchilishch i shkol VVS Sovetskoi Armii. Moskva, Voen-  
izdat, 1955. 334 p. (MIRA 16:11)

(Meteorology in aeronautics)

IGNAT'YEV, V.A.; IGNAT'YEV, N.I.; SHOR, A.Ya.; SIDOROVA, L.A.,  
red.

[Problems in arithmetic; textbook for elementary school  
teachers] Sbornik zadach po arifmetike; posobie dlia  
uchitelei nachal'noi shkoly. Izd.4., ispr. Moskva, Pro-  
sveshchenie, 1965. 277 p. (MIRA 18:7)

IGNAT'YEV, N.I.; CHEKMAROV, Ya.P.

[Teaching mathematics and arithmetic methods in pedagogical schools]  
Prepodavanie matematiki i metodiki arifmetiki v pedagogicheskom  
uchilishche. Moskva, Uchpedgiz, 1954. 48 p. (MIRA 8:2D)

IG-NAT'YEV, N.I.

IGNAT'YEV, V.A.; IGNAT'YEV, N.I.; SHOR, Ya.A.; BORISOV, A.A., redaktor;  
RYBIN, I.V., ~~tekhnicheskii~~ redaktor

[Collection of arithmetic problems; a textbook for pedagogical schools] Sbornik zadach po arifmetike; posobie dlia pedagogicheskikh uchilishch. 2-e izd. Moskva, Gos. uchebno-pidagog. izd-vo Ministerstva prosveshcheniia RSFSR, 1954. 375 p. (MLRA 8:7)  
(Arithmetic--Problems, exercise, etc.)

IGNAT'YEV, N. I.

IGNAT'YEV, Venidikt Antonovich; IGNAT'YEV, Nikolay Ivanovich; SHOR, Yakov Aleksandrovich; SIDOROVA, L.A., redaktor; RYBIN, I.V., tekhnicheskii redaktor

[Arithmetic lesson plans; for grade 3 of the elementary school]  
Plany urokov po arifmetike; dlia 3 klassa nachal'noi shkoly. Izd. 2-oe, perer. Moskva, Uchebno-pedagog. izd-vo Ministerstva prosveshcheniia RSFSR, 1956. 181 p. (MLA 10:2)  
(Arithmetic--Study and teaching)

IGNAT'YEV, N.I.

Mechanized spreading of crushed stone. Avt.dor. 20 no.3:29 Mr  
'57. (MIRA 10:5)

(Estonia--Road machinery)

IGNAT'YEV, N

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Televideniye (Television) Moskva, Seyaz'izdat, 1951.  
207 p. Diagr., Tables.

AB No. 520183

IGNAT'YEV, N.K.

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TREASURE ISLAND BOOK REVIEW

AID 780 - M

[Supercedes AID 393 - I]

IGNAT'YEV, N. K.

Televideniye (Television). State Publishing House of Literature on Problems of Communications and Radio, 1952. 200 p. 10,000 copies printed.

**ANALYSIS AND EVALUATION:**

The book is intended as a textbook on television for communications technical schools where television is taught as part of a more general course "Television and Photo-Communications", and is approved by the Ministry of Communications of the USSR for use as a textbook. The approach is largely descriptive, with little mathematical and electrical analysis. In its general plan, the book seems to follow rather closely the work of Kenneth Fowler and Harold B. Lippert (both of General Electric) Television Fundamentals Theory, Circuits and Servicing, McGraw-Hill Book Co., first published in 1948. While the reviewed book is much less detailed, it does give some information on Russian and particularly Soviet achievements in this field.

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IGNAT'YEV, N. K., Televideniye

AID 780 - M  
[Supercedes AID 393 - I]

Chapter I. Physical Fundamentals of Television, pp. 6-27.  
The basic properties of light and the light characteristics of televised objects are described. The physiology of vision is explained and the basic conceptions of the photoeffect, internal and external, and some photoelectric instruments are described. Works of A. G. Stoletov (1888, p. 15) in this field are mentioned. Mechanical and electronic television are explained. A description of a method of mechanical scanning (based on progressive scanning) invented in 1884 by P. Nipkov (pp 21-22) is given. In 1907 B. L. Rozing suggested cathode-ray scanning (p. 23, 25) and in 1931-32 S. I. Katayev developed a cathode-ray transmitting tube called "ionoscope" which is described (pp. 25-26). The first high quality TV transmissions in the USSR were started in 1937 when an ultrashort-wave transmitting center was put in operation in Moscow. The image was scanned into 343 lines, or low clearness. In 1948 the Moscow TV center started to scan into 625 lines, which, according to the author, is the highest clearness in the world. [The number of frames transmitted per second in the USSR is 25. Thus the line frequency is  $625 \times 25 = 15,625$ , compared with the US standard of  $525 \times 30 = 15,750$ ].

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IGNAT'YEV, N. K., Televideniye

AID 780 - M

Chapter II. Cathode-Ray Tubes, pp. 28-77. The chapter gives a description of the electromagnetic and electrostatic types of cathode-ray tubes and also of the special types of tubes where the beam is focused by electrostatic means and deflected by electromagnetic means. Elements common to all types are discussed. The author explains the movement of electrons in the electric and magnetic fields by introducing simple equations. He describes the electron focusing and deflecting systems used and explains the role of secondary electron emission in the performance of TV tubes. S. I. Katayev (p. 56) and L. A. Kubetskiy (p. 57) contributed much in secondary electron emission. The picture tube with various types of fluorescent screens is described, as well as certain of the most common defects like the halo and ion spot and means for their prevention. A description of the television camera follows: the iconoscope, its functioning and deficiencies, its modifications as developed by L. A. Kubetskiy (p. 70-71), S. I. Katayev (p. 71), P. V. Shmakov and P. V. Timofeyev (p. 71), the orthicon, and the orthicon with the electron multiplier and the image transfer.

3/6

IGNAT'YEV, N. K., Televideniye

AID 780 - M

Chapter III. Television Signals and Their Transmission, p. 78-123. Basic requirements for television pictures are described and the scanning process is explained. The full television signal and its components: line and field synchronizing pulses, horizontal and vertical blanking signals, and equalizing pulses, are described as well as the general requirements for the television transmission path. Explanations are given of signal-to-interference ratio and various kinds of noises; the pick-up tube sensitivity and minimum brightness (threshold of sensitivity), video i-f amplifiers: compensated one- or two-stage resistance-coupled amplifiers, low-frequency and high-frequency compensation, and noise limiters of the AFC-type (automatic frequency control of the horizontal sweep generator). The transmitter plant equipment: the studio, control room and transmitting terminal, is described in conclusion.

Chapter IV. Reception of Television Signals, pp. 124-150. The over-all operation of the receiver is explained step by step with the help of a block-diagram. The r-f and i-f circuits and in turn the video and sound carriers, the video channel's clipper stage, the synchronizing pulses, horizontal

4/6

IGNAT'YEV, M. K., Televideniye

AID 780 - M

and vertical deflection circuits with their sweep generators and the speaker and the picture tube are described.

Chapter V. Television Scanning, p. 151-179. Sync and scanning as used in television receivers are described, but the more complex schemes of sync and scanning of the picture signal are not given. The chapter explains the scanning methods and the operation of the various circuit elements: saw-tooth oscillators or sweep generators, three types of which are described (the gas-tube oscillator, the blocking oscillator, and the multivibrator), deflection circuits (electrostatic and electromagnetic), transient oscillations and RC damping circuits, synchronization and generators of saw-tooth current. The chapter ends with a brief enumeration of high-voltage power supply systems.

Chapter VI. Basic Problems of Modern Television, p. 180-197. The author discusses the outstanding problems of modern television: 1) extension of the range of TV reception, and studies in this field by S. I. Katayev (p. 181-182); 2) television translation, with a description of the first television

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IGNAT'YEV, N. K., Televideniye

AID 780 - M

radio translating center for 500 receivers, designed in 1939 by R. I. Budanov and V. N. Gorshunov (p. 182-184); 3) the large screen, with a description of the method suggested by Academician A. A. Chernyshev in 1925 (p. 187); 4) color television, particularly work in this field by I. A. Adamian in 1908 based on the Nipkov scanning disk (p. 188-189) and the system developed in 1929 by Yu. S. Volkov (p. 189-191); 5) other problems, like video-telephone and stereoscopic television.

The book ends with a table of the relations between various systems of electrical units. Some Soviet references are mentioned in the text.

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6(6)

PHASE I BOOK EXPLOITATION

SOV/1842

Ignat'yev, Nikolay Konstantinovich

Televideniye (Television) 2nd ed., rev. Moscow, Svyaz'izdat, 1958.  
231 p. Errata slip inserted. 25,000 copies printed.

Ed.: Ye.S. Novikova; Resp. Ed.: V.F. Samoylov; Tech. Ed.:  
S.F. Karabilova.

PURPOSE: The book is approved by the Ministry of Communications of  
the USSR as a textbook for students of communication tekhnikums.

COVERAGE: This is an enlarged second edition of the book published  
in 1951. The author states that Chapters 4 and 5 dealing with  
television transmission and reception were revised and enlarged.  
A discussion of color television in Chapter 5 is included in the  
book for the first time. A number of other problems which do  
not apply to modern television are excluded from this edition.  
No personalities are mentioned. There are no references.

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Television

SOV/1842

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SOV/1842

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AVAILABLE: Library of Congress (TK6630.I25)

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Card 5/5

IGNAT'YEV, N.K.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1528  
 AUTHOR IGNAT'EV, N.K.  
 TITLE Basic Properties and Characteristics of Synchronous Filters.  
 PERIODICAL Radiotekhnika, 11, fasc. 9, 59-71 (1956)  
 Issued: 19.10.1956

A considerable number of devices for dividing complicated oscillations into two components, viz. synchronous and asynchronous components, have already been described in literature. The present work investigates the operation of all these devices for the special purpose of constructing the so-called synchronous filter, which is the natural generalized form of the resonance filter. Unlike the latter the synchronous filter is able to eliminate or absorb oscillations of any form which are repeated with a given frequency  $f_0$  to which it is "tuned". The basic and integral component of a synchronous filter is the "memory" which must "remember" the shape of the oscillations encountered. Here the ideal wiring circuit of a synchronous filter with a capacity storage device is used. The basic parameters of a synchronous filter are the operation  $f_0$  and the extinction coefficient  $b$ . These parameters fully characterize the filter's influence on the shape of the input voltage. Owing to the fact that on the occasion of the operation the potential of the connected capacities changes several times, the shape of the voltage transferred from the "memory" is "zagged" ( ). Analysis of the operation of the filter began with the setting up of an initial formula which expresses the relation between input- and output voltage. By means of this initial formula it is possible to solve

Radiotekhnika, 11, fasc. 9, 59-71 (1956)

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all tasks, i.e. such with a stable and such with transition character. The formula is then used for the investigation of the influence exercised by some shapes of the input voltage on the synchronous filter. This is done firstly because these shapes are of great practical interest, and secondly because hereby the characteristics and the properties of the filter are best determined. These shapes include: the periodic voltage of an arbitrary shape, the harmonic voltage, and the noise voltage. These various forms of input voltage are then investigated. In the case of the last of these forms, the ability of the integrating filter of diminishing noise voltage is described as "filtration coefficient", and the relation between the latter and the parameters of the filter is set up in form of an equation.

The question is then investigated by what equivalent resistance the capacity "memory" can be replaced in the circuit of the synchronous filter. It was found that for this purpose a drawn-out line may be used, which is all the more natural, because a line has the peculiar property of having a "memory". In principle any other device able to "remember" the shapes of the oscillations encountered can be used.

INSTITUTION:

*ICARD #1 VEV, N.K.*

APPROVED FOR RELEASE: 04/03/2001

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COMMUNICATION

"Concerning Certain Geometric Properties of the Optimum Code," by N. K. Ignat'yev, Elektrosvyaz', No 6, June 1957, Pp 3-9

Discussion of the choice of the best configuration of signal space for placing in it the dots of an optimum-code signal (i.e., a code, insuring maximum signal entropy, other conditions being equal). Cases are investigated, in which the dots of the signal are placed in a volume of an n-dimensional sphere, on the surface of an n-dimensional sphere, and in the volume of an n-dimensional cube.

IGNAT'YEV, N.K.

Conversion of multidimensional communications into discrete  
communications. Nauch.dokl.vys.shkoly; radiotekh. i elektron.  
no.1:63-70 . ' 58. (MIRA 12:1)

1. Nauchno-issledovatel'skiy institut Ministerstva svyazi  
SSSR.

(Information theory)

SOV/162-58-3-1/26

9(1).

AUTHOR:

Ignat'yev, N.K.

TITLE:

The Statistic Characteristics of N-Dimensional Information (Statisticheskiye kharakteristiki mnogo-mernykh soobshcheniy)

PERIODICAL:

Nauchnyye doklady vysshey shkoly, Radiotekhnika i elektronika, 1958, Nr 3, pp 3-12 (USSR)

ABSTRACT:

All known communication channels permit a transmission of information only as functions of one variable (time) and are therefore one-dimensional. N-dimensional information (for example, moving or stationary pictures) must be preliminarily scanned for transmitting and is thereby converted to one-dimensional information. The principal statistic characteristics of information are the correlation function and the energy spectrum which are generalized by the author for the case of n-dimensional information. The author investigates how the scanning process, by converting n-dimensional information into one-dimensional information, simultaneously changes also the statistic characteristics.

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SOV/162-58-3-1/26

The Statistic Characteristics of N-Dimensional Information

He produces formulae which connect the statistic characteristics of information before and after scanning. He discusses in separate paragraphs the correlation function, energy spectrum, filtering, scanning, the correlation function after scanning and the enrgy function after scanning. He arrives at the conclusion that the application of n-dimensional statistic characteristics of information may simplify the solution of a number of problems, because the n-dimensional statistic characteristics are much simpler than one-dimensional functions of the same information after scanning. The relation established in this way permit a transition from spatial statistic characteristics to spectral characteristics and vice versa. There is 1 Soviet reference.

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The Statistic Characteristics of N-Dimensional Information SOV/162-58-3-1/26

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy institut  
Ministerstva svyazi (State Scientific Research In-  
stitute of the Ministry of Communications)

SUBMITTED: June 2, 1958

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IGNAT'YEV, N.K.

Transients in comb filters. Nauch.dokl.vys.shkoly; radiotekh.i  
elektron. no.4:153-163 '58. (MIRA 12:6)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut Ministerstva  
svyazi.

(Transients(Electricity)) (Radio filters)

AUTHOR: Ignat'yev, N.K.

SOV/106-59-1-3/12

TITLE: The Energy Spectrum of a Television Signal (Energeticheskiy spektr televizionnogo signala)

PERIODICAL: Elektrosvyaz', 1959, Nr 1, pp 21-27 (USSR)

ABSTRACT: It is 24 years since the publication of the classic paper by Mertz and Gray. The essentially new feature in the present article is the use of correlation between the brightness elements of the transmitted image to give quantitative information and also to take account of distortion due to movement of the transmitted object. The associated shortcomings of a television picture due to a finite scanning spot size and aperture distortion are neglected. The position of the scanning spot relative to its position at a slightly different instant can be represented by a three-dimensional correlation function  $D$ . The appearance of the scanning raster is shown in Fig 1 with the separate time dependences of  $x$  and  $y$  scans in Fig 2. Fig 3 is a diagram showing the relative duration of stay of two points at various distances from one another in the  $x$ -axis direction. Eq (1) is a description of the scan process in terms of point-to-point displacements and time intervals, instead of point

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SOV/106-59-1-3/12

## The Energy Spectrum of a Television Signal

position and time. A transformed version of the correlation function using these particular variables is given in (3). This expression may be thought of as referring to a virtual scanning system as shown in Fig 4, where point-to-point displacements are plotted instead of actual distances. Eq (5) is an analytical expression for the energy spectrum and can be obtained as a Fourier transform of the one-dimensional correlation function  $B_1(\tau)$  in (3). That case of the greatest interest is the one where the three-dimensional correlation function can be expressed in the form of a product of three one-dimensional functions as in (6). This is shown in more detail in (7) and (8). It is possible to show (see Appendix 1) that the overall energy spectrum may be expressed through the separate energy spectra by means of a two-fold correlation integral (10). Since the separated one-dimensional correlation functions for the two dimensions of the scan are periodic, then their energy spectrum can only be expressed in terms of delta functions (see Appendix 2). The three separate frequency trans-

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The Energy Spectrum of a Television Signal

two-fold convolution (see Appendix 3) giving a final expression (16). Two cases of this latter expression should be noted: when the number of lines  $z$  is odd, the scan is repetitive; and when  $z$  is even, the scan is progressive. The space and time correlation functions of a television image have been studied by a number of authors, in particular Kretzmer (Ref 2). If the appropriate functions are approximated by Gaussian curves, Figs 5a and 5b show the energy spectrum for repeated and progressive scans respectively for the case where the number of lines is  $z = 5$ . Detailing in the image along the direction of the scanning line is determined by the overall extent of the spectrum. The amount of picture detail at right angles to this direction is determined by the amount of the spectrum which groups itself around the harmonics of line frequency. The crowding of the spectrum around harmonics of the same frequency is a measure of the speed with which the image can change. Finally, brief mention is made of the distortion effects

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which attend the interaction of spectra giving rise to  
moiré effect and stroboscopic effect.

There are 5 figures, 3 appendices and 4 references,  
2 of which are Soviet and 2 English.

SUBMITTED: April 21, 1958

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IGNAT'YEV, N.K.

Application of delta functions in investigating discrete processes  
with a number of communications. Nauch.dokl. vys. shkoly; radiotekh.  
i elektron. no. 2:14-20 '59. (MIRA 14:5)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut Ministerstva  
svyazi.

(Information theory)

IGNAT'YEV, N.K.

Frequency characteristics of comb filters. Nauch. dokl. vys. shkoly;  
radiotekh. i elektron. no.2:210-224 '59. (MIRA 14:5)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut Ministerstva  
svyazi. (Electric filters) (Pulse techniques (Electronics))

AUTHOR: Ignat'yev, N.K. SOV/106-59-6-11/14  
 TITLE: The Frequency Spectrum of the Sweep of an n-Dimensional  
 Message (Short Communication) (Chastotnyy spektr  
 razvertki n-mernykh soobshcheniy)  
 PERIODICAL: Elektrosvyaz', 1959, Nr 6, pp 74-75 (USSR)

ABSTRACT: A method of obtaining the frequency spectrum of signals  
 formed as the result of scanning a n-dimensional message  
 is described. The method is based on the use of  
 $\delta$ -functions, by means of which the law of displacement  
 of the reading element in the scan process is described.  
 The case considered is the scan of function  $F(x, y, \tau)$   
 within the limits of a rectangle

$$-\frac{X}{2} \leq x \leq \frac{X}{2}, -\frac{Y}{2} \leq y \leq \frac{Y}{2} \quad (1)$$

and equal to zero beyond its limits. A television  
 message, where  $x$  and  $y$  are the space co-ordinates  
 and  $\tau$  is the time co-ordinate, is such a function.  
 If the periods of the  $x$  and  $y$  sweeps are  $T_1$  and  $T_2$   
 respectively, then, taking account of the limit (1),  
 the trajectory of the reading element can be expressed  
 as:

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The Frequency Spectrum of the Sweep of an n-Dimensional Message

$$D_R(x, y, \tau, t) = \sum_i \delta \left[ x - X \left( \frac{t}{T_1} + i \right) \right] \times \\ \times \sum_K \delta \left[ y - Y \left( \frac{t}{T_2} + k \right) \right] \delta(\tau - t) \quad (2)$$

where  $i$  and  $k$  are whole numbers. The first and second cofactors describe the periodic sawtooth displacement of the reading element along the  $x$  and  $y$  axes respectively. The third cofactor describes the continuous displacement of the reading element in time. The signal  $f(t)$ , appearing as a result of the scan, is

$$f(t) = \int \int_{-\infty}^{\infty} \int F(x, y, \tau) D_R(x, y, \tau, t) dx dy d\tau \quad (3)$$

and, taking Eq (2) into account, takes the form

$$f(t) = \sum \sum F \left[ X \left( \frac{t}{T_1} + i \right) \times Y \left( \frac{t}{T_2} + k \right), t \right] \quad (4)$$

Card 2/4 If  $F(x, y, \tau)$  has a Fourier transform

$$S(\omega_1, \omega_2, \omega_3) = \int \int_{-\infty}^{\infty} \int F(x, y, \tau) e^{-i(\omega_1 x + \omega_2 y + \omega_3 \tau)} dx dy d\tau, \quad (5)$$

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The Frequency Spectrum of the Sweep of an n-Dimensional Message  
then, in the given case,

$$s(\omega) = \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} S(\omega_1, \omega_2, \omega_3) D_S \times (\omega_1, \omega_2, \omega_3, \omega) d\omega_1 d\omega_2 d\omega_3, \quad (6)$$

where

$$D_S(\omega_1, \omega_2, \omega_3, \omega) = \left( \frac{1}{2\pi} \right)^3 \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} D_R(x, y, \tau, t) \times \\ \times e^{i(\omega_1 x + \omega_2 y + \omega_3 \tau - \omega t)} dx dy d\tau dt \quad (7)$$

Function (7) gives the spectral density of the reading  
unction (2) and acts in the spectral region of the  
message in the same manner as the reading function in the  
real region. The result can be generalised to the scan  
of functions with any number of dimensions  $n$ .

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The Frequency Spectrum of the Sweep of an n-Dimensional Message

The results are applied to two cases:

- 1) a television scan,
- 2) a photo-telegraph message.

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There are no figures, no references.

SUBMITTED: January 23, 1959

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SOV/106-59-8-2/12

AUTHORS: Ignat'yev, N.K. and Kustarëv, A.K.

TITLE: Methods of Reducing the Spectrum of a Television Signal

PERIODICAL: Elektrosvyaz', 1959, Nr 8, pp 14 - 23 (USSR)

ABSTRACT: This is a short review of bandwidth compression methods, as described in the technical literature. The methods are classified on the basis of their action and can be divided into two basic groups:

- 1) Methods in which the statistical properties of the signal are not considered and in which the frequency band is exchanged - a) for time or b) for signal power.
- 2) Methods which use the statistical properties of the television image considered as a function of three variables (two space co-ordinates and one time co-ordinate).

The statistical methods can be also divided into two sub-groups: A) without signal "discretization", in which the continuous nature of the signal is maintained by the "free" parts of the spectrum are filled up; B) with discretization, in which only separate discrete values of the signal are transmitted.

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SOV/106-59-8-2/12

Methods of Reducing the Spectrum of a Television Signal

The classification scheme is shown in Figure 1. Under each sub-group are listed the methods which enter into that particular sub-group. Methods, which for some reason or other, cannot be included in the classification, are placed in the group marked "others". Not all the methods have the same value from scientific or practical points of view. These methods are then considered individually in more detail.

In the frequency-time exchange method, the initial signal is "accumulated" and then transmitted at a lower rate. At the receiver the process is reversed and the initial signal recovered. This method reduces the bandwidth to the same degree as the transmission time is increased but has not found practical application due to undesirable increase in the transmission time, and difficulties in realising the "accumulation".

In a television signal there is, however, some free time, i.e. time intervals occupied by synchronising and suppression pulses, and by using this time, it is possible to reduce the bandwidth approximately 20%.

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Methods of Reducing the Spectrum of a Television Signal

In the frequency-power exchange method, a large degree of frequency bandwidth compression can theoretically be obtained but to obtain a permissible error in the presence of interference, a large number of power levels are required and the total power is so large that the method has not found practical application.

The statistical methods without discretization, in which the free parts of the spectrum are filled, are classified as statistical, since the law of the distribution of energy in the spectrum is a statistical parameter of the television signal. The television signal spectrum is then considered and a part of it (for progressive scan of a stationary image) is as shown in Figure 2a. When a moving image is transmitted, the discrete components of the spectrum merge into a frequency band.

Two methods for using these free parts are considered:

- 1) the method of "alternate-line" scanning and
- 2) the method of "alternate-point" scanning.

Interlacing of the lines and of the points of the raster correspond to particular interlacing of the frequency

Card3/5 spectrum.

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Methods of Reducing the Spectrum of a Television Signal

Finally, under statistical methods without discretization, are considered interchannel, spectrum-filling methods in which two or more transmitters work on the one and same frequency channel. The general principle underlying the statistical methods of spectrum compression with discretization of the signal is as follows: the continuous information is divided into discrete values which are then transformed into a code. In the discretization process analysis is made of sections of the message, and from all of its possible discrete combinations only the most probable are transmitted by some code. The code capacity is calculated for transmission of these message combinations only. Signal compression is obtained by reducing the number of discrete message combinations to a minimum. Thus, all the methods of this group are different forms of signal combinations in which the statistical features are taken into account to some degree. The variations considered are:

- 1) coding of the difference signal;
- 2) transmission of the coordinates of new values;

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Methods of Reducing the Spectrum of a Television Signal

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3) two-speed scanning.

Finally, the author considers other methods -

a) Method of compression of the frame frequencies.

b) Increase in the sharpness of the brightness transitions.

c) A method of alternate transmission of high-frequency components.

d) Quantization with variable step.

There are five figures and 23 references, of which 14 are English and 9 Soviet.

SUBMITTED: April 1, 1959

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26233  
S/106/60/000/001/001/005  
A056/A126

24.1300

AUTHOR: Ignat'yev, N. K.

TITLE: Synthesis of the amplitude-frequency characteristic after the expansion of its coefficients into series

PERIODICAL: Elektrosvyaz', no. 1, 1960, 3 - 10

TEXT: The author investigates various methods of synthesis of the amplitude-frequency characteristic after the expansion of its coefficients into series. First, he quotes the "Vocoder" by Dudley [Ref. 1: "The Vocoder". Bell Lab. Record, dec. 1939] and the system of harmonic synthesis. A true reproduction of the amplitude-frequency characteristic of separate circuits does not result from the difference of their phase-frequency characteristics, and the synthesis of frequency characteristics is accompanied by specific alterations. The author analyzes the system of synthesis proposed by A. A. Pirogov [Ref. 2: Avtorskoye svidetel'stvo (Author's Certificate) no. 112254 kl. 21a<sup>2</sup>, 3622], which eliminates this disadvantage and gives a more accurate reproduction of the frequency characteristics required. The basis of this system is a set of elementary filters, and not a set of oscillating circuits, generating resonance frequencies as in the case of the Vo-

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3/106/60/000/001/001/005

A056/A126

Synthesis of the amplitude-frequency characteristic...

order. The development of the functions of the elementary signals tends to a matrix transformation, connecting the problem of the expansion into series of the frequency characteristics with the signals definition. The matrix transformer may be composed of dividing resistors. The negative values will be determined in function of the corresponding phase vectors. For each concrete case, the parameters of the matrix depend on the expansion into series of the amplitude-phase characteristics, and on the choice of the phase-frequency characteristics. Further, the author develops some methods of synthesis, particularly synthesis from impulse functions (analogous to the Vocoder), the harmonic synthesis without dephasing and the harmonic synthesis with dephasing. There are 7 figures and 2 references: 1 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Ministerstvo Svyaz' SSSR (USSR Ministry of Communications)

SUBMITTED: September 11, 1959

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26207  
S/106/60/000/002/008/009  
A055/A133

6,2000 (1159,1344)

AUTHOR: Ignat'yev, N. K.

TITLE: Rendering discrete the signals with unlimited spectrum.

PERIODICAL: Elektrosvyaz', no. 2, 1960, 71 - 72

TEXT: The author describes a simple method for analyzing the conversion of continuous communication into a sequence of discrete of time-separated sendings. This method is essentially a spectrum method. The "time-separation process" (protsess diskretizatsii) of signal  $f_1(t)$ , in the presence of filters at the input and at the output of the system, can be expressed as:

$$f_2(t) = \int_{-\infty}^{\infty} \int f_1(\tau) g_1(x-\tau) d\tau D(x) \times g_2(t-x) dx, \quad (1)$$

where  $f_2(t)$  is the resulting signal,  $g_1(t)$  is the input filter transfer function and  $D(x)$  is the "time-separating" ("diskretiziruyushchaya") function:

$$D(x) = T \sum_k \delta(x - kT), \quad (2)$$

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S/106/60/000/002/008/009  
A055/A133

Rendering discrete the signals with unlimited spectrum

where  $\delta(x)$  is a delta-function and  $T$  is the "time-separation" interval. Function  $D(x)$  transforms, as a result of multiplication, the continuous function of the variable  $x$  into a pulse function of the same variable, different from 0 only for  $x = kT$ . After a Fourier transformation of (1), the author obtains:

$$s_2(\omega) = \sum_m s_1\left(\omega - m \frac{2\pi}{T}\right) k_1\left(\omega - m \frac{2\pi}{T}\right) k_2(\omega), \quad (3)$$

where  $s_1(\omega)$ ,  $s_2(\omega)$ ,  $k_1(\omega)$  and  $k_2(\omega)$  are Fourier transformations for functions  $f_1(t)$ ,  $f_2(t)$ ,  $g_1(t)$  and  $g_2(t)$  respectively. The first two functions express the signal spectrum before and after "time-separation", and the last two functions are the frequency characteristics of the corresponding filters. Figure 1a explains the formation process of the resulting spectrum, without taking into account the filter action. It shows that distortions of the initial spectrum  $s_1(\omega)$  are due to the appearance of additional components, absent in the initial spectrum. To eliminate these components, the spectra of the initial and the resulting signal must obviously be limited by frequency  $|\omega| = \frac{\pi}{T}$ . It follows from (3) and Figure 1a that "time-separation" ("diskretizatsiya") (used, for instance, in pulse modulation) leads to distortions even in the absence of interferences

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